

**What is claimed is:**

1. An OLED device comprising:
  - (a) a substrate;
  - (b) an active region positioned over said substrate, wherein said active region comprises an anode layer, a cathode layer and a light-emitting layer disposed between the anode layer and the cathode layer;
  - (c) a polymeric layer disposed over said active region, under said active region or both over and under said active region, said polymeric layer having microparticles incorporated therein, said microparticles being effective to increase the out-coupling efficiency of the OLED.
2. The OLED of claim 1, wherein the substrate comprises an inorganic material or an organic material.
3. The OLED of claim 2, wherein the substrate comprises a transparent material.
4. The OLED of claim 2, wherein the substrate comprises glass, metal, or a silicon-based material.
5. The OLED of claim 2, wherein the substrate comprises a polymeric material.
6. The OLED of claim 5, wherein the substrate comprises a flexible polymeric material.
7. The OLED of claim 5, wherein the substrate comprises one or more polymeric materials selected from the group consisting of polyesters, polyolefins, polycarbonates, polyethers, polyimides and polyfluorocarbons.
8. The OLED of claim 1, wherein the polymeric layer having microparticles incorporated therein is disposed on a top surface of said substrate.

9. The OLED of claim 8, wherein the substrate comprises glass or a transparent flexible polymeric material.

10. The OLED of claim 1, further comprising one or more composite barrier layers disposed over said active region, under said active region or both over and under said active region, said one or more composite barrier layers comprising an alternating series of one or more polymeric planarizing sublayers and one or more high-density sublayers; wherein said microparticles are incorporated within at least one of said polymeric planarizing sublayers.

11. The OLED of claim 10, wherein said composite barrier layer is disposed on a top surface of said substrate.

12. The OLED of claim 11, wherein said substrate comprises glass or a transparent flexible polymeric material.

13. The OLED of claim 10, wherein said composite barrier layer comprises an alternating series of two or more polymeric planarizing sublayers and two or more high-density sublayers.

14. The OLED of claim 13, wherein said composite barrier layer is disposed over said active region.

15. The OLED of claim 13, wherein said microparticles are incorporated within at least two of said polymeric planarizing sublayers.

16. The OLED of claim 13, wherein said composite barrier layer is disposed on said substrate, and said microparticles are incorporated within a polymeric planarizing sublayer closest to said substrate.

17. The OLED of claim 13, wherein said composite barrier layer is disposed on said substrate, and said microparticles are incorporated within a polymeric planarizing sublayer closest to said active region.

18. The OLED of claim 10, wherein said composite barrier layer is disposed over said active region.

19. The OLED of claim 1, wherein the active region comprises a pixel and the size of said microparticles is smaller than the smallest lateral dimension of said pixel.

20. The OLED of claim 19, wherein the largest dimension of said pixel is from about 10  $\mu\text{m}$  to about 300  $\mu\text{m}$  and the size of said microparticles is from about 0.4  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

21. The OLED of claim 1, wherein said microparticles comprise a transparent inorganic or polymeric material.

22. The OLED of claim 21, wherein said microparticles comprise glass.

23. The OLED of claim 21, wherein said microparticles comprise a metal, a metal oxide or a ceramic material.

24. The OLED of claim 23, wherein said microparticles comprise  $\text{TiO}_2$ .

25. The OLED of claim 1, wherein said microparticles comprise a material having a refractive index of about 1.7 or greater.

26. The OLED of claim 1, wherein the refractive index of said microparticles is different from the refractive index of said polymeric layer.

27. The OLED of claim 26, wherein the difference between the refractive index of said microparticles and the refractive index of said polymeric layer is greater than about 0.3.

28. The OLED of claim 10, wherein said polymeric planarizing sublayer comprises a material selected from the group consisting of fluorinated polymers, parylenes, cyclotenes and polyacrylates.

29. The OLED device of claim 10, wherein said high-density material is selected from the group consisting of metals, metal oxides, metal nitrides, metal carbides and metal oxynitrides.

30. The OLED device of claim 10, wherein said high-density material is selected from the group consisting of silicon, silicon oxides, silicon nitrides, silicon carbides, silicon oxynitrides, indium oxides, indium tin oxides, zinc indium tin oxides, tin oxides, aluminum oxides, aluminum nitrides, and titanium oxides.